Small Business Innovation Research/Small Business Tech Transfer

Nano-Phase Powder Based Exothermic Braze Repair Technology For RCC Materials, Phase II

Completed Technology Project (2005 - 2007)

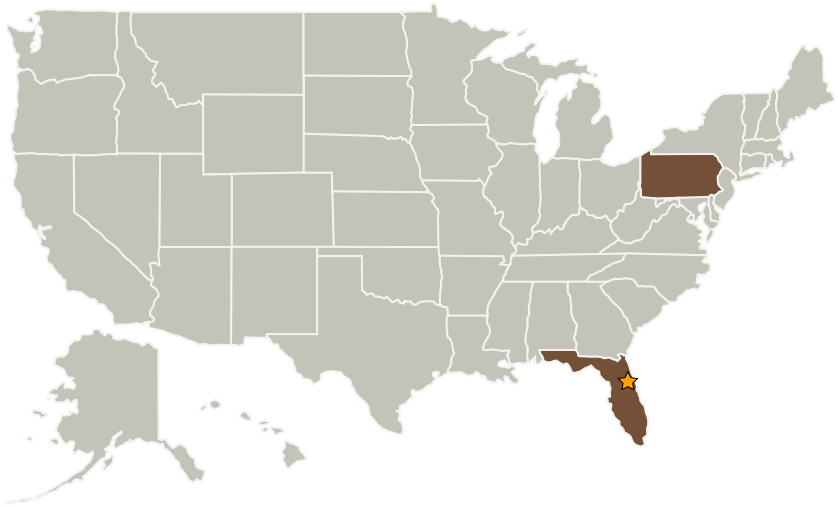
Project Introduction

The Phase II project will advance innovative, cost effective and reliable nano-phase exothermic RCC joining processes (ExoBraze

TM

) in order to be able to reinforce or repair of space shuttle or other reentry vehicle TPS structures. MRi, Boeing and NASA-Glen Research Center will be partnering to improve exothermic joining process control, to develop preforms that can bond RCC panels in a variety of configurations, to increase the joint strength and demonstrate process robustness, to test joints to validate expected service performance and to scale the joining process in order to fabricate demonstrator components for test and validation. The Phase II effort will look at improved WO3-Al exothermic precursors and develop preform based on polymer bound mats that control the amount of exothermics delivered to the RCC joints. MRi and its partners will develop methods to improve bond strengths through the use of joint prelayers, such as NASA-GRC's GRABER materials or other glass formers. After process improvements are made, MRi and Boeing will, using subcomponents, develop and demonstrate RCC panel repairs, stengthener ribs and panel doublers for as part of its robust RCC efforts. Mechanical and thermal tests will then be designed and conducted to develop more realistic test data on ExoBraze RCC joint performance.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

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Organizations Performing Work	Role	Type	Location
★Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Materials Resources International	Supporting Organization	Industry	Lansdale, Pennsylvania

Primary U.S. Work Locations	
Florida	Pennsylvania

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.3 Thermal Protection Components and Systems
    - TX14.3.1 Thermal Protection Materials